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Agricultural Memorandum No 579

Hay Yield/Transpiration relationship

V Bailey

Agricultural Memorandum No 27 established a relationship between hay yields and transpiration over the period 1939-56. A check was carried out for the more recent period 1962-71 for the south central region (Dorset, Wilts, Hants and IOW).

As before hay yields were obtained from volumes of Agricultural Statistics (HMSO) and a constant improvement was assumed throughout the period. The formula used was

$$\text{Yield} = 16.53 + 1.50\ T + 0.32\ N$$

where T is the actual transpiration (in inches)
and N the number of years from 1961

Year	Transpiration (T)	Year count (N)	Yield (cwt/acre)	Estimated Yield
1962	7.0	1	28.6	27.4
1963	8.3	2	28.9	29.6
1964	9.7	3	32.6	32.0
1965	8.7	4	30.1	30.9
1966	9.1	5	31.3	31.8
1967	9.5	6	31.9	32.7
1968	9.6	7	34.1	33.2
1969	8.9	8	33.3	32.4
1970	6.8	9	29.1	29.6
1971	9.9	10	34.3	34.6

Partial correlation between yield and transpiration = 0.85
Partial correlation between yield and time = 0.58
Multiple correlation between yield and estimated yield = 0.93

The transpiration value for 1963 does not include March as, for much of this month, the ground was snow covered.

References

L P Smith 1960 - Relation between weather and Meadow-hay yields in England 1939-56 - Journal of British Grassland Society Vol 15. No 3 203-208

L P Smith 1962 - Meadow-hay yields:- Outlook on Agriculture Vol III No 5 219-224.

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
Bracknell